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MESH, GENNADIY				
ART UNIT		PAPER NUMBER		
1796				
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary

Application No.

10/542,228

Applicant(s)

RINK ET AL.

Examiner

GENNADIY MESH

Art Unit

1796

Period for Reply -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 19 October 2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 17, 18 and 21-39 is/are pending in the application.
- 4a) Of the above claim(s) 23, 24 and 27-35 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 17, 18, 21-22, 25-26 and 36-39 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1.1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 10/19/2009 has been entered.

1.2. Claims 1-16 and 19 -20 are canceled by Applicant. Claims 27 - 39 are newly added. Claims 23 and 24 have been withdrawn. Claims 17 -18, 21-22 and 26-26 were previously rejected. It is noted that status of Claim 23 is incorrect: claim 23 listed as "Currently amended" Appropriate correction is required.

Election/Restrictions

2.1. Newly submitted claims 27 - 39 are directed to an invention that is independent or distinct from the invention originally claimed for the following reasons: independent Claims 27 - 35 directed to process of preparing polyester, wherein polyester does not comprise **terminal hydroxyl groups**. For this reason, process of preparing polyester claimed by Claims 27 - 35 is different and patentably distinct from originally claimed process of independent Claim 17. Since applicant has received an action on the merits for the originally presented invention, this invention has been constructively elected by original presentation for prosecution on the merits. Accordingly, claims 27 - 35 are

withdrawn from consideration as being directed to a non-elected invention. See 37 CFR 1.142(b) and MPEP § 821.03.

2.2. Therefore, Claims 23-24 and 27 - 35 are withdrawn. Claims 17-18, 21-22, 25-26 and 36 - 39 will be examined on the merits.

2.3. Support for amendment of Claim 17 has been found in paragraphs [0010], [0021] and [0022] of the published Specification (see US 2006/0235189) . Support for newly added Claims 36 - 39 has been found in paragraphs [0010], [0021],[0022] ,[0027], [0063] and Examples of published Specification (see US 2006/0235189) and as indicated by Applicant. Therefore, no New Matter has been introduced with this Amendment.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claim 39 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Specifically, it is not clear from language of claim 39 if polyester comprises two glycols or product of reaction between two glycols.

For examination on the merits, it will be understood that polyester, claimed by claim 39, comprises two glycols - neopentyl glycol and hexanediol.

Claim Rejections - 35 USC § 103

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

4. Claims 17-18, 21-22 and 25-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Weikard et al. (US 6,150,458) in view of Kobayashi et al. "Enzymatic Polymerization".

Regarding Claim 17 Weikard discloses process for preparation of (meth)acrylic acid ester by reacting hydroxyl group containing polyester with (meth)acrylic acid in the presence of esterefication catalyst (see abstract) and pointing out that polymers obtained by the process can used as radiation curable binders (see column 4,lines 11-14).

Weikard is silent regarding conducting this process with specific catalyst as enzyme.

However, Kobayashi teach that process of polymer modification, wherein terminal hydroxyl group of polyester can react with carboxylic acid could be catalyzed by lipase (enzyme) catalyst in order to give end-functionalized polyester - (see page 3813, paragraph 4 Polymer Modification) and pointing out that enzymatic polymerization can be conducted under mild conditions without using toxic reagents by natural catalyst with "green" appeal in commercial benefit and ecological requirement - see page 3793, right column third paragraph.

Therefore, it would be obvious to one of ordinary of skill use lipase(enzyme) catalyst per teaching of Kobayashi in order to obtain modifies polyester by process of

Weikard "under mild conditions without using toxic reagents by natural catalyst with "green" appeal in commercial benefit and ecological requirement".

Note, that process disclosed by Weikard combined with Kobayashi is substantially same as process claimed by Applicant. Therefore, it would be reasonable to assume that this process will not lead to reduction of in molecular weight of the polyester as it required by new limitation of claim 17 as " wherein process does not result in any reduction in molecular weight of the polyester " until evidence to the contrary can be shown.

Regarding limitation of Claim 18: Kobayashi teach (see page 3811, paragraph 2-Polymerization of Diacid and Glycols), that :

"biotransformation of various combinations of dicarboxylic acid derivatives and glycols to bio-degradable polyesters have been reported. Dicarboxylic acids as well as its derivatives, activated and nonactivated esters, cyclic acid anhydride, and poly-anhydrides, were found to be employed as useful monomers for the enzymatic synthesis of polyesters under mild reaction conditions. Many dicarboxylic acids and their alkyl esters are commercially available; however, they often showed **low reactivity toward lipase catalyst**. Thus, development of the reaction apparatus and **reaction conditions** has been made for efficient production of higher molecular weight polyesters. ... a horizontal two chamber reactor was employed to remove the **leaving water molecules with molecular sieves**."

Therefore, it would be obvious to remove water from reaction mixture as it claimed in Claim 18.

Regarding Claim 21 Kobayashi teach that quantity of enzyme catalyst depending on activity of specific enzyme and relatively large quantity up to 40 wt% could be used if it required for efficient production of the polymer (see top of page 3808).

Therefore, one of ordinary skill in the art would be motivated to use significant amount of enzyme catalyst in order to develop efficient production process using specific enzyme catalyst.

Regarding Claims 22 and 25-26 Kobayashi teach, that Lipases, is an enzyme which catalyses the hydrolysis of fatty acid esters in living system (therefore lipases belongs to hydrolases) can be used as a catalyst for esterification and transesterification (see last paragraph on pages 3806 and first paragraph on page 3807) and further teach, that specific Lipases as Candida (lipases CA) and Murcor (lipases MM - see page 3810, right column) can catalyzed polymerization of diacids and glycols.

5. Claims 36 - 39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Weikard et al.(US 6,150,458) in view of Kobayashi et al." Enzymatic Polymerization" as it applied to Claims 17-18, 21-22 and 25-26 above, and in further view of Gruning et al.(US 6,268,521).

5.1. As discussed above Weikard in view of Kobayashi disclosed substantially same process as claimed by Applicant in claims 36 - 39, including rational to conduct modification of polyester with terminal hydroxyl groups with acrylic acids in presence of lipase catalyst under mild conditions, but is silent regarding temperature suitable for lipase catalyzed process.

However, Gruning teach, that lipase catalyzed process for preparation of acrylic esters should be conducted under mild conditions at temperature in range from 20⁰ C to 100⁰ C, preferably from 40⁰ C to 70⁰ C (see column 4, lines 54-60).

Therefore, it would be obvious to one of ordinary to conduct modification process of the polyester with acrylic acids disclosed by Weikard in view of Kobayashi at preferable temperature range as it taught by Gruning and claimed by Applicant.

5.2. Regarding Claims 37 -39 see Weikard column 2, lines 25 - 30.

Response to Arguments

6. Applicant's arguments filed on October 19, 2009 have been fully considered but they are not persuasive.

7. Applicant's arguments related to Claims 17-18, 21-22 and 25-26 rejected under 35 U.S.C. 103(a) as being unpatentable over Weikard et al.(US 6,150,458) in view of Kobayashi et al." Enzymatic Polymerization" based on following:

a) Applicant argues that "The process of the claimed invention provides a product that **unexpectedly avoids reduction in molecular weight of the polyesters**".

However, Applicant did not provide any factual results to show that molecular weight of the polyester obtained by process disclosed by Weikard combined with Kobayashi is reduced. Therefore, this argument was found unpersuasive.

b) Applicant also argues that: "...The compositions of the invention can be advantageously used as coating materials, particularly as topcoat materials or clearcoat

materials. Such clearcoat materials are used for producing multicoat color and/or effect systems, especially multicoat color and/or effect paint systems using wet-on-wet techniques. Since the resultant clearcoats of the invention are the outermost coats of the multicoat paint systems, they are critical to the overall appearance and protect the color and/or effect coats against mechanical and chemical damage and damage due to radiation. Consequently, any deficiencies in the hardness, scratch resistance, chemical stability, or yellowing stability are highly problematic in the clearcoat. It was found that clearcoats using the enzyme-catalyzed functionalized polyesters of the present invention are **highly scratch resistant and, after exposure to scratching, exhibit only very small losses of gloss."**

In response to this applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., highly scratch resistant and, after exposure to scratching, exhibit only very small losses of gloss) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

Therefore, this argument also found unpersuasive.

c) Next applicant's argument based on alleged deficiency of individual references. Regarding disclosure provided by Weikard applicant stated "The Office Action cites Weikard for a process of preparing esters of (meth)acrylic acid. Weikard is directed, however, to solving certain problems that have nothing to do with **enzyme catalysts**".

In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

It is clear that from language of Applicant's claims 17 and 36 that any polyesters with terminal hydroxyl groups can be used in process claimed by Applicant, including polyesters obtained by any or no catalysts. Therefore, this argument also found unpersuasive.

Regarding Kobayashi Applicant stated "The Kobayashi reference is a lengthy 25-page monograph devoted almost exclusively to the use of enzymes as polymerization catalysts, not to functionalize an already-formed polymer as specified in Applicants' claimed invention. The lone reference to **functionalization of already- formed polymers is found at page 3813**, where the reference briefly mentions that that lipase catalysts have been used for functionalizing poly(e-CL)."

Thus, Applicant admitted on the record, that Kobayashi does teach that polyester can be functionalized in presence of lipases catalyst, specifically (see paragraph 4 of rejection above) **terminal hydroxyl group of polyester** can react with **carboxylic acid** could be catalyzed by **lipase (enzyme) catalyst** in order to give **end-functionalized polyester** - (see page 3813, paragraph 4 Polymer Modification).

Thus, this and all Applicant's arguments were found unpersuasive for the reasons stated above.

Conclusion

THIS ACTION IS NOT MADE FINAL.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to GENNADIY MESH whose telephone number is (571)272-2901. The examiner can normally be reached on 10 a.m - 6 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Milton Cano can be reached on (571) 272 1398. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Milton I. Cano/
Supervisory Patent Examiner, Art Unit 1796

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/GM/